

CLAIMS

[1] A travel vibration suppressing device 20 of a working vehicle being characterized by comprising:

a hydraulic pump 21;

at least one actuator 11 actuated by pressure oil discharged from the hydraulic pump 21;

an accumulator 27 connected to one pressure chamber in the at least one actuator 11 for absorbing a pressure pulsation in the pressure chamber;

a directional control valve 29 for controlling the pressure oil supplied from the hydraulic pump 21 to the actuator 11; and

a ride control valve 31, 31A, 31B for controlling a communication and a cutoff between the accumulator 27 and the pressure chamber,

wherein the ride control valve 31, 31A, 31B is arranged on the directional control valve 29 in a laminated manner by an internal piping.

[2] The travel vibration suppressing device according to claim 1, being characterized in that

a first pressure sensor 81 for detecting a load pressure of the actuator 11 and/or a travel state detecting sensor 84 for detecting a travel state of the working vehicle is arranged, and

a communication opening area of the ride control valve 31B is controlled on a basis of a detected signal from the first

pressure sensor 81 and/or the travel state detecting sensor 84.

[3] The travel vibration suppressing device according to claim 2, being characterized in that

a second pressure sensor 82 for detecting a pressure of an accumulator 27 is arranged, and

when a detected pressure of the accumulator 27 detected by the second pressure sensor 82 is higher than the load pressure of the actuator 11 detected by the first pressure sensor 81, a ride control valve 31A is controlled so as to reduce the pressure of the accumulator 27 to the load pressure of the actuator 11, and thereafter the accumulator 27 is communicated with a pressure chamber.

[4] The travel vibration suppressing device according to any one of claims 1 and 2, being characterized in that the ride control valve 31B is structured so as to freely change an upper limit opening area that is opened as a communication opening area.

[5] The travel vibration suppressing device according to claim 4, being characterized in that a control for reducing the upper limit opening area is executed as a load pressure of an actuator 11 becomes higher and/or as a traveling speed of a working vehicle 1 becomes higher.

[6] The travel vibration suppressing device according to claim 4, being characterized in that a control for expanding the upper limit opening area is executed as a load pressure of an actuator 11 becomes lower and/or as a traveling speed of a working vehicle

1 becomes lower.

[7] The travel vibration suppressing device according to any one of claims 1 and 2, being characterized in that the ride control valve 31 is provided with a variable throttle 88 for equalizing pressures in the pressure chamber and the accumulator 27.

[8] The travel vibration suppressing device according to any one of claims 1 and 2, being characterized by further comprising a speed increasing valve 33 for supplying the pressure oil from the hydraulic pump 21 to the at least one actuator 11, wherein the speed increasing valve 33 is arranged on the ride control valve 31, 31A, 31B or the directional control valve 29 in a laminated manner by the internal piping and/or an external piping.